CLAIMS

What is claimed is:

1. A system for evaluating a signal characterizing output of a process of assessing chemical materials manifested as an irregular array of signals, the array being a grid of sub-grids of the chemical materials, said system comprising:

a memory storing generated digital data relating to performance of the process; and

a processor for accessing the digital data from said memory and for determining therefrom a level of confidence in the signal characterizing output of the process.

2. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by measuring an area of a respective spot.

3. The system of claim 2, said processor determining the level of confidence in the signal characterizing output by comparing the area of a respective spot to an area of a respective signal.

4. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by determining an ellipticity of a respective signal.

5. The system of claim 4, said processor determining the level of confidence in the signal characterizing output by determining an orientation of the ellipticity of a respective

signal.

6. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by determining a degree of deviation of a respective signal from a circle.

7. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by determining an area of contamination in a window around a respective signal that excludes other signals in the array.

8. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by comparing an intensity for a respective signal with an intensity for contamination in a window around the respective signal that excludes other signals in the array.

9. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by determining a level of alignment between the sub-grids.

10. The system of claim 1, said processor determining the level of confidence in the measurement of the signal by determining a level of uniformity in distance between the sub-grids.

11. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by determining a number of missing sub-grids in the array.

12. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by measuring a degree of parallelism of rows and of columns of each sub-grid.

13. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by measuring a degree of orthogonality between rows and columns of each sub-grid.

14. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by measuring a background variation in a window around a respective signal that excludes other signals in the array.

15. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by evaluating a degree of deviation between a center location of a respective spot and a point in the grid associated with the respective spot.

16. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by measuring a degree of background variation in the array.

17. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by evaluating a geometric property of the digital data.

18. The system of claim 1, said processor determining the level of confidence in the signal characterizing output by evaluating a global property of the digital data.

19. A method of evaluating a signal characterizing output of a process of assessing chemical materials manifested as an irregular array of signals, the array being a grid of sub-grids of the chemical materials, said method comprising the steps of:

a. generating digital data characterizing a performance aspect of the process; and

b. determining from the digital data a level of confidence in the signal characterizing output of the process.

20. The method of claim 19, wherein the step of generating digital data comprises calculating an area of a respective spot of the signal characterizing output.

21. The method of claim 20, wherein the step of generating digital data further comprises comparing the area of a respective spot of the signal characterizing output to an area of a respective signal of the signal characterizing output.

22. The method of claim 19, wherein the step of generating digital data comprises determining an ellipticity of a respective signal of the signal characterizing output.

23. The method of claim 35, wherein the step of generating digital data comprises determining an orientation of the ellipticity of a respective signal of the signal characterizing output.

24. The method of claim 19, wherein the step of generating digital data comprises determining a degree of deviation of an outline of a respective signal of the signal characterizing output from a circle.

25. The method of claim 19, wherein the step of generating digital data comprises determining an area of contamination in a window around a respective signal of the signal characterizing output that excludes other signals in the array.

26. The method of claim 19, wherein the step of generating digital data comprises comparing an intensity for a respective signal of the signal characterizing output with an intensity for contamination in a window around the respective signal that excludes other signals in the array.

27. The method of claim 19, wherein the step of generating digital data comprises determining a level of alignment between the sub-grids.

28. The method of claim 19, wherein the step of generating digital data comprises determining a level of uniformity in distance between the sub-grids.

29. The method of claim 19, wherein the step of generating digital data comprises determining a number of missing sub-grids in the array.

30. The method of claim 19, wherein the step of generating digital data comprises measuring a degree of parallelism of rows and of colwnns of each sub-grid.

31. The method of claim 19, wherein the step of generating digital data comprises measuring a degree of orthogonality between rows and columns of each sub-grid.

32. The method of claim 19, wherein the step of generating digital data comprises measuring a background variation in a window around a respective signal of the signal characterizing output that excludes other signals in the array.

33. The method of claim 19, wherein the step of generating digital data comprises evaluating a degree of deviation between a center location of a respective spot of the signal characterizing output and a point in the grid associated with the respective spot.

34. The method of claim 19, wherein the step of generating digital data comprises measuring a degree of background variation in the array.

35. The method of claim 19, wherein the step of generating digital data comprises evaluating a geometric property of the digital data.

36. The method of claim 19, wherein the step of generating digital data comprises evaluating a global property of the digital data.

37. A computer readable medium having stored therein one or more sequences of instructions for evaluating a signal characterizing output of a process of assessing chemical materials manifested as an irregular array of signals, the array being a grid of sub-grids of the chemical materials, said one or more sequences of instructions causing one or more processors to perform a plurality of acts, said acts comprising:

a. generating digital data characterizing a performance aspect of the process; and

b. determining from the digital data a level of confidence in the signal characterizing output of the process.

38. The computer readable medium of claim 37, said act of generating digital data being performed by calculating an area of a respective spot of the signal characterizing output.

39. The computer readable medium of claim 38, said act of generating digital data being further performed by comparing the area of a respective spot of the signal

characterizing output to an area of a respective signal of the signal characterizing output.

40. The computer readable medium of claim 37, said act of generating digital data being performed by determining an ellipticity of a respective signal of the signal characterizing output.

41. The computer readable medium of claim 40, said act of generating digital data being further performed by determining an orientation of the ellipticity of a respective signal of the signal characterizing output.

42. The computer readable medium of claim 37, said act of generating digital data being performed by determining a degree of deviation of an outline of a respective signal of the signal characterizing output from a circle.

43. The computer readable medium of claim 37, said act of generating digital data being performed by determining an area of contamination in a window around a respective signal of the signal characterizing output that excludes other signals in the array.

44. The computer readable medium of claim 37, said act of generating digital data being performed by comparing an intensity for a respective signal of the signal characterizing output with an intensity for contamination in a window around the

respective signal that excludes other signals in the array.

45. The computer readable medium of claim 37, said act of generating digital data being performed by determining a level of alignment between the sub-grids.

46. The computer readable medium of claim 37, said act of generating digital data being performed by determining a level of uniformity in distance between the sub-grids.

47. The computer readable medium of claim 37, said act of generating digital data being performed by determining a number of missing sub-grids in the array.

48. The computer readable medium of claim 37, said act of generating digital data being performed by measuring a degree of parallelism of rows and of columns of each sub-grid.

49. The computer readable medium of claim 37, said act of generating digital data being performed by measuring a degree of orthogonality between rows and columns of each sub-grid.

50. The computer readable medium of claim 37, said act of generating digital data being performed by measuring a background variation in a window around a respective signal of the signal characterizing output that excludes other signals in the array.

51. The computer readable medium of claim 37, said act of generating digital data being performed by evaluating a degree of deviation between a center location of a respective spot of the signal characterizing output and a point in the grid associated with the respective spot.

52. The computer readable medium of claim 37, said act of generating digital data being performed by measuring a degree of background variation in the array.

53. The computer readable medium of claim 37, said act of generating digital data being performed by evaluating a geometric property of the digital data.

54. The computer readable medium of claim 37, said act of generating digital data being performed by evaluating a global property of the digital data.

55. The system of claim 1, wherein the set of signals represents an output of a process for assessing a set of proteomic and genomic data samples arranged as data points in a pre-determined spatial arrangement such that each data point has an expected position in the pre-determined spatial arrangement.

56. The system of claim 55, wherein the pre-determined spatial arrangement is a grid-type array.

57. The system of claim 56, wherein the grid-type array comprises a multi-level grid.

58. The system of claim 55, wherein the pre-determined spatial arrangement is a microarray.

59. The system of claim 55, wherein a level of confidence is a position offset level of confidence for the data point determined from the offest between an expected position of a data point and a respective actual position of the data point.

60. The method of claim 19, wherein the set of signals represents an output of a process for assessing a set of proteomic and genomic data samples arranged as data points in a pre-determined spatial arrangement such that each data point has an expected position in the pre-determined spatial arrangement.

61. The method of claim 60, wherein the pre-determined spatial arrangement is a grid-type array.

62. The method of claim 61, wherein the grid-type array comprises a multi-level grid.

63. The method of claim 60, wherein the pre-determined spatial arrangement is a microarray.

64. The method of claim 60, wherein the level of confidence is a position offset level of confidence for the data point determined from the offest between an expected position of a data point and a respective actual position of the data point.

65. The computer readable medium of claim 37, wherein the set of signals represents an output of a process for assessing a set of proteomic and genomic data samples arranged as data points in a pre-determined spatial arrangement such that each data point has an expected position in the pre-determined spatial arrangement.

66. The computer readable medium of claim 65, wherein the pre-determined spatial arrangement is a grid-type array.

67. The computer readable medium of claim 66, wherein the grid-type array comprises a multi-level grid.

68. The computer readable medium of claim 65, wherein the pre-determined spatial arrangement is a microarray.

69. The computer readable medium of claim 65, wherein the level of confidence is a position offset level of confidence for a data point determined from the offest between the expected position of a data point and a respective actual position of the data point.

70. The system of claim 1, wherein the level of confidence is a background contamination level of confidence for the data point determined by measuring the background contamination in an image snip surrounding a data point.

71. The method of claim 19, wherein the level of confidence is a background contamination level of confidence for the data point determined by measuring the background contamination in an image snip surrounding a data point.

72. The computer readable medium of claim 37, wherein the level of confidence is a background contamination level of confidence for the data point determined by measuring the background contamination in an image snip surrounding a data point.

73. The system of claim 1, wherein each data point is represented by at least one pixel, with the pixels of the data point representing a subset of the pixels contained in an image snip, and where the level of confidence is an ignored pixel percentage level of confidence for the data point determined based on the percentage of the pixels in the snip representing the data point.

74. The method of claim 19, wherein each data point is represented by at least one pixel, with the pixels of the data point representing a subset of the pixels contained in an image snip, and where the level of confidence is an ignored pixel percentage level of confidence for the data point determined based on the percentage of the pixels in the snip representing the data point.

75. The computer readable medium of claim 37, wherein each data point is represented by at least one pixel, with the pixels of the data point representing a subset of the pixels contained in an image snip, and where the level of confidence is an ignored pixel percentage level of confidence for the data point determined based on the percentage of the pixels in the snip representing the data point.

76. A system for assessing chemical material samples arranged as a grid, the system comprising:

a memory for storing a digital image of the grid, where the digital image derived from a signal received from the chemical material samples, and is comprised of pixels; and

a processor for accessing the digital image from said memory, identifying characteristics of the grid from the image, detecting a pixel representing the center of a signal received from a chemical material sample and an approximate radius of the signal received from the chemical material sample, segmenting the signal, and calculating a characterizing measure for the segmented signal.